

REMARKS**Drawings**

The drawings stand objected to under 35 CFR 1.83(a) as not showing every feature of the invention specified in the claims. The examiner states that subject matter of claims 3-6 is not depicted in the drawings. Claims 3-6 have been canceled to overcome this objection. Accordingly it is requested that the objection to the drawings be withdrawn.

Claim Rejections 35 U.S.C. § 112

Claims 1-8, 10-14, 17, and 18 stand rejected under 35 U.S.C. 112 as indefinite.

Claim 3-6 have been canceled. Claim 1 has been amended and claims 12, 17, and 18 have been amended and rewritten in independent form to more clearly define applicants' claimed invention.

Regarding claim 8, the examiner states that "*...the spacer and its thickness is represented by nL but the description only shows nH*". It is respectfully submitted that this is incorrect. In claim 8, the spacer is represented as nH. It is in claim 7 that the spacer is represented as nL. Such a spacer is described in applicants' page 22, line 17 of applicants' application.

Regarding claim 12, the examiner gives a reason for rejecting the claim "*...for failing to particularly point out how "x" is to be interpreted or used within the stacking sequence*". It is respectfully submitted that one skilled in the art would recognize that "x" is to be interpreted as a multiplier for the quarter wave thickness "H" which it precedes, particularly since the claim states that "x" is between about 4 and 1000.

In view of the amendments to the claims and the foregoing arguments regarding claims 8 and 12, it is requested that the rejection of claims under 35 U.S.C. 112 be withdrawn.

Claim Rejections 35 USC § 102

Claims 1-3, 6-8, 10, 17 and 18 stand rejected under 35. U.S.C. 102(b) as being anticipated by Trost et al. Claims 3-6 have been canceled. Claim 1 has been amended and claims 12, 17, and 18 have been amended and rewritten in independent form to more clearly define applicants' claimed invention. The rejection is respectfully traversed for reasons set forth below.

Applicants' invention as defined by amended claim 1 is directed to an optical filter comprising an **opaque, reflective metal** layer. A dielectric spacer layer is deposited on said metal layer and a dielectric stack of alternating relatively high and low refractive index layers is deposited on the spacer layer. The thickness of said dielectric spacer layer and the high and low refractive index layers are selected such that the filter has a resonant wavelength at which wavelength incident radiation is channeled (induced) into, and absorbed by, the metal layer. Applicants' invention as defined by amended claim 12 defines an optical filter comprising a tiered multi-layer stacking sequence of Substrate / $M(HL)^2 \times H(LH)^2$ / ambient, where H and L equal one quarter-wave optical thickness, of relatively high and low refractive index materials and M is an **opaque reflective metal** layer. The multiplying factor "x" is between about 4 through 1000. This filter has a plurality of resonant wavelengths spaced apart on a wavelength scale, at which wavelengths incident radiation is channeled into, and absorbed by, the metal layer. Applicants' invention as defined by amended claim 17 defines a laser resonator formed between two mirror with at least one of the mirrors including the filter of amended claim 1. Applicants' invention as defined by amended claim 18 defines a laser resonator formed between two mirror with at least one of the mirrors including the filter of amended claim 12.

The invention of Trost et al. (Trost - which was developed at Coherent, Inc., the assignee of the subject application) is directed to providing a mirror that reflects and directs infrared laser radiation (CO₂ laser radiation on particular) yet transmits visible radiation such that an observer can see through the mirror to observe a site to which the infrared radiation is directed. Trost teaches that the invention is superior for this purpose to a prior-art, visible-transmitting, infrared-reflecting mirror, known to practitioners of the art and described by Trost as (col. 2, line 29), as an "**Induced Transmission**" filter. Applicants describe their inventive filter as an "**Induced Absorption Filter**" (see Title of applicants application).

The examiner states:

"Trost et al. disclose an optical filter Fig. 4-6 comprising; a dielectric stack 38 (or 42, 44, 46, 48, 64) of alternating relatively high and low refractive index layers; an opaque, reflective metallic layer 34 and a dielectric spacer 36 (or 40) layer located between the dielectric stack and the metallic layer, the filter having a resonant wavelength, at which wavelength radiation is channeled into, and absorbed by, the metallic layer 34, see col. 4, line 27 – col. 8, line 12."

It is respectfully submitted that the examiner has misinterpreted the disclosure and teaching of Trost. Trost specifies (col. 4, lines 30-39) layer 34 **not as a metal layer** but as a layer composed of an “**oxide semiconductor**” such as indium tin oxide, CdO, or SnO₂. Trost does not describe any layer as a “spacer layer” and does not discuss resonance, or a resonant wavelength in any context.

In a filter depicted in FIG. 4, Trost describes (col. 4, lines 56-61) that the oxide semiconductor layer is surmounted by a sequence or multilayer coating (*i.e.*, a stack) of layers 36 designed so that they enhance the reflection of infrared radiation while having minimal impact on the transmission of visible radiation. An additional coating 38, deposited on coating 36, is described (col. 4, lines 65-69) as providing narrow band visible reflection.

FIG. 5 of Trost depicts details of above-discussed infrared-reflecting visible-transmitting coating 36, which is described (col. 5, lines 64-69) as including layers 42, 44, 46, 48, and 64 having a quarter wavelength optical thickness for enhancing the infrared reflection, with these layers being separated by stacks (41, 43, 45, etc) of thinner layers for preventing the infrared reflecting coating from interfering with visible transmission, and, clearly, without interfering with the enhancement of infrared reflection. FIG. 6 of Trost is described as depicting a variation of the above-discussed filter of FIG. 4., in which a narrow band visible reflecting coating 38 is coated directly on a substrate, the oxide semiconductor layer 34 is deposited on coating 38, and infrared reflection enhancing coating 36 is deposited on coating 38.

In addition to the fact that layer 34 of Trost is **not an opaque, reflective, metal layer as described and claimed by applicants**, it is clear from the description in col. 5, lines 14-26 of Trost that dielectric stack 36 of Trost (which the examiner chooses to equate with applicants dielectric layer stack) is configured to **prevent absorption** of radiation in layer 34 rather than to deliberately **induce or channel absorption** as described and claimed by applicant. By way of example, in col. 5, lines 15-18 Trost teaches “*However, without coating 36 an indium tin oxide layer 34 will absorb approximately 20% of the power of an incident 10.6 micrometer treatment beam*”, and in col. 5, lines 19-26 teaches “*For most applications (including virtually all high power applications) the invention must include coating 36 to reflect enough infrared treatment beam radiation to prevent filter damage due to excessive power absorption*”.

In view of the above-presented arguments, it is respectfully submitted that Trost does not disclose a filter having the same elements as applicants’ inventive filter, the elements of the

filter of Trost do not act together in the same way as the elements of applicants filter, and do not provide the result provided by applicants' filter. Accordingly, it is submitted that applicants' invention is not anticipated by the disclosure of Trost, and it is requested that the rejection of claims under 35 U.S.C. 102(b) be withdrawn.

Claim Rejections 35 USC § 103

Claims 4, 5, and 11-14 stand rejected under 35 U.S.C. 103(a) as unpatentable over Trost et al. (Trost). Claims 4 and 5 have been canceled. The rejection of remaining claims is respectfully traversed for reasons set forth below.

Claim 11, 13 and 14 depend on claim 1. Claim 12 has been amended into independent form. Differences between applicants' invention as defined by claims 1 and 12 and filters disclosed in Trost are discussed above with respect to the rejection of the claims under 35 U.S.C. 102 (b). It is respectfully submitted that claims 11-14 are patentable over Trost for these reasons alone. Accordingly, it is requested that the rejection of claims under 35 U.S.C. 103(a) be withdrawn.


Summary

In view of the foregoing, it is respectfully submitted that claims remaining in the application are patentable over the reference relied on by the examiner and are in condition for allowance. Accordingly, it is requested that the claims be allowed at the earliest possible opportunity.

Respectfully submitted,

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